

**LITHOGRAPHIC APPARATUS, DEVICE MANUFACTURING METHOD,  
AND DEVICE MANUFACTURED THEREBY**

**ABSTRACT**

During device manufacturing, a beam of radiation is projected onto a substrate via a mask. The substrate is aligned with the mask using an alignment structure on the substrate, with properties of the light reflected from (or transmitted by) the alignment structure being used to determine the relative position of the substrate. Earlier processing of the substrate may cause errors in the position determined from the reflected light. In one embodiment of the invention, measurement of properties of the reflected light are used to determine a correction for errors caused by processing of the substrate. Parameters of a physical model of the alignment structure may be estimated from the reflected light and used to determine the correction. Amplitudes of a plurality of different diffraction peaks may be measured to determine the correction.